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Satoshi Tanaka

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EXAMINER

GRUN, ROBERT J

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/531,006	Applicant(s) TANAKA ET AL.	
	Examiner ROBERT J. GRUN	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 24, 25 and 36-41 is/are pending in the application.
- 4a) Of the above claim(s) 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 24 and 36-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-11, 36-38 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stang et al. (US 4,777,186) in view of Slaats et al. (US 3,970,732).

- Regarding Claim 1: Stang et al. disclose: 1) providing a mold cavity at atmospheric pressure (col. 3 line 4), 2) injecting foamable material into the mold cavity (col. 1 lines 37-39), 3) pressurizing the mold (col. 3 lines 36-38), 4) foaming the material under pressure (abstract) 4) releasing the pressurization of the mold (col. 3 lines 36-38 and col. 4 lines 38-47). Stang et al. does not specifically disclose controlling the injection flow rate of the foamable material into the mold cavity, however any injection of material into the mold would necessarily include controlling the flow rate. This is true because by picking a particular resin and having a particular mold with a certain size (length and radius) of the runner to the mold and by controlling the pressure of the material the user necessarily controls the flow rate as given by the Hagen-Poiseuille equation $Q = \frac{\pi R^3}{s + 3} \left(\frac{R \Delta P}{2mL} \right)^s$ where Q is the flow rate, L and R are the length/radius of the runner, m is the viscosity, and s is a constant based on the polymer. While Stang et al. do not disclose the foamable material is mechanically

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mixed, Slaats et al. teaches mechanical mixing of the components of the plastic material via a mixing chamber with agitator (col. 4 lines 53-55). One having ordinary skill in the art at the time of invention would have found it obvious to mechanically mix the components of the foamable material to ensure thorough mixing of the components and blowing agent. Additionally while Stang et al. do not disclose a tube with a valve for controlling the pressure of the chamber, they do disclose that the chamber is vented at a specific pressure, implying both a venting channel (tube) and a valve which releases the pressure when it rises above a certain amount.

- Regarding Claim 2: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. Stang et al. further disclose the hermetic (air tight) closing of the mold to allow pressurization (col. 4 lines 41-44).
- Regarding Claims 3, 4, and 5: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claims 1 and 2. Stang et al. further disclose various orders of introduction of the foam and the predetermined gas to the closed reaction vessel (col. 2 lines 50-55 and Examples).
- Regarding Claims 6, 7, and 8: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. Stang et al. further disclose controlling the pressure at a predetermined level and controlling said pressure after introduction of the foamable material (Examples 11 and 12).
- Regarding Claim 9 and 11: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. Stang et al. further disclose discharging a gas from inside the cavity to outside the cavity by venting of the excess pressure

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which inherently requires opening the cavity of the mold with a valve (col. 3 lines 19-23).

- Regarding Claim 10: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. Stang et al. further disclose maintaining of various pressures in the cavity between 5 psig and 50 psig ($.35 \text{ kg/cm}^2$ - 3.52 kg/cm^2) (Examples).
- Regarding Claims 36-38: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. As described above, Stang et al. disclose various methods of controlling the pressure such as: maintaining a pressure in the mold (Example 11-12) by depressurizing the cavity by releasing a gas from the mold (venting of the cavity (col. 3 lines 19-23)). While Stang et al. does not specifically state that the amount of gas released is based on an injected amount of the foamable material, they do disclose maintaining the pressure by releasing the gas produced in the polyurethane reaction to maintain the pressure. Such release would inherently depend on the amount of foamable material.
- Regarding Claim 41: Stang et al. and Slaats et al. disclose the invention as described above in the rejection of Claim 1. As described above, while Stang et al. do not disclose the foamable material is mechanically mixed, Slaats et al. teaches mechanical mixing of the components of the plastic material via a mixing chamber with agitator prior to introduction into the mold (col. 4 lines 53-55). One having ordinary skill in the art at the time of invention would have found it obvious to

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mechanically mix the components of the foamable material to ensure thorough mixing of the components and blowing agent.

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaminski et al. (US Patent No. 5,283,924), in view of Stang et al. (US 4,777,186) and further in view of Slaats et al. (US 3,970,732).

- Kaminski teaches the foaming of a polymeric foam around a solid core to produce a foam brush used for dental hygiene (abstract). Stang et al. and Slaats et al. teach a method and apparatus for producing a high quality polymeric foam as described above in the rejection of claims 1-11. One of ordinary skill in the art at the time of invention would have found it obvious to use the method and apparatus in Stang et al. to form the brush in Kaminski, since both are in the same polymeric foam art. The person of ordinary skill at the time of invention would have found it obvious to use the foaming method and apparatus of Stang et al. and Slaats et al. to form foam around a core in order to provide soft foam brush to tooth cleaning devices.

4. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stang et al. (US 4,777,186) and Slaats et al. (US 3,970,732) as applied to claim 1 above, and further in view of Jennings (US 3,551,947).

- Regarding Claims 39 and 40: Stang et al. disclose the invention as described above in the rejection of Claim 1. Stang et al. does not disclose the use of a flowmeter to control the flow of injection of the foamable material. However one having ordinary skill in the art at the time of invention wanting to control the flow of material into the mold would have found the use of a instrument known in the art (flow-meter such as

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used in Jennings) to control the flow of polyurethane into the mold in order to allow precise control of the amount of material injected and thus the pressure inside the mold.

Response to Arguments

5. Applicant's arguments filed September 10, 2009 have been fully considered but they are not persuasive for the following reasons:

- Applicant's first argument is that Stang et al. do not disclose an opening a discharge valve so that the chamber is at atmospheric pressure. This argument is not persuasive because first of all the mold starts at atmospheric pressure (col. 3 lines 3-5) and secondly Stang et al. disclose venting the chamber when the pressure in the mold exceeds a certain value (col. 3 lines 31-35). Therefore if the mold was not at atmospheric pressure to begin with it would be obvious to use said vent to increase/decrease the pressure to be at atmospheric pressure. Additionally while Stang et al. does not disclose the vent as being a tube, such venting mechanisms are well known in the art.
- Applicant's second argument is that Stang et al. does not disclose mechanically mixing the gas with the foamable material. While Examiner agrees Stang et al. does not disclose mechanical mixing of the foamable material, this deficiency is remedied by Slaats et al. Additionally Examiner would like to point out that the **claim as written does not require mechanical mixing of the material with a gas**, as argued by Applicant. Instead the claim **as written** requires mechanical mixing of the foamable material said foamable material to be foamed with a gas. Stang et al.

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teaches that the foamable material in question is eventually foamed by carbon dioxide (a gas) created in the reaction of water with isocyanate (col. 4 lines 12-19).

- Applicant argues that injection of the foamable material in an injection molding process does not “necessarily include controlling the flow rate”. Examiner disagrees as described above in the rejections of claims 1 and 24 (by reference to Claim 1).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT J. GRUN whose telephone number is (571)270-5521. The examiner can normally be reached on Monday-Friday 10:30-8.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Katarzyna WYROZEBSKI can be reached on (571) 272-1127. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROBERT J GRUN/
Examiner, Art Unit 1791

/Maria Veronica D Ewald/
Primary Examiner, Art Unit 1791